AMENDMENTS

Amendments to the Claims

Please amend the claims as follows:

1. (Currently Amended) An article of manufacture comprising a program storage medium readable by a processor and embodying one or more instructions executable by a processor to perform a method for passing data between an eXtensible Markup Language (XML) document and a hierarchical database, the method comprising:

providing an Information Management System (IMS) hierarchical database;

providing a metadata schema derived from the IMS hierarchical database, the metadata schema comprising a first representation representative of the hierarchical structure of the IMS hierarchical database, a second representation representative of the hierarchical structure of XML documents valid for passing into and out of the IMS hierarchical database, a database field name, and an XML element name that maps to the database field name; ~~and~~

passing data between an XML document and the IMS hierarchical database using the metadata schema~~.~~, further comprising:

receiving the XML document comprising XML elements organized according to the metadata schema;

matching an XML element of the XML document with a metadata element defined in the metadata schema; and

storing content data from the XML element in a database field of the hierarchical database identified by the matching metadata element; and

passing an intact XML document to the IMS hierarchical database and storing it intact, further comprising:

receiving the XML document and a database node identifier;

initializing a first database node of the hierarchical database identified by the database node identifier;

sequentially writing raw data from the beginning of the XML document into the first database node; and

selectively identifying a break point in the XML document, in response to the first database node filling with raw data, the method further comprising,

initializing a second database node that is a child of the first database node; and

sequentially writing raw data from the break point of the XML document into the second database node.

2. (Canceled).

3. (Currently Amended) The article of manufacture of claim ~~2~~ 1, further comprising selectively storing a sub-tree of the XML document intact in one or more nodes of the hierarchical database in response to a directive metadata element in the metadata schema, the sub-tree comprising an XML root element and one or more XML descendent elements stored with XML formatting information.

4. (Canceled).

5. (Currently Amended) The article of manufacture of claim ~~4~~ 1, further comprising:

examining each XML element in the XML document and corresponding metadata element in the metadata schema, in response to an index indicator identified within the metadata schema for the XML document;

storing an index value from an XML element identified by the index indicator;

generating a secondary index that includes the first database node and at least the index value, such that the first database node is locatable using a database query that includes the index value.

6. (Original) The article of manufacture of claim 1, wherein passing data comprises retrieving the eXtensible Markup Language (XML) document from the hierarchical database, the method further comprising:

receiving a query for the XML document;

matching each database field of the hierarchical database with a metadata element defined in the metadata schema;

generating an XML element defined by the matching metadata element, the XML element comprising content data from the matching database field; and

assembling the XML elements into the XML document.

7. (Currently Amended) The article of manufacture of claim ~~4~~ 1, further comprising selectively retrieving a sub-tree of the XML document from one or more nodes of the hierarchical database in response to a directive metadata element in the metadata schema, the sub-tree comprising an XML root element and one or more XML descendent elements stored with XML formatting information.

8. (Original) The article of manufacture of claim 1, wherein passing data comprises retrieving the (XML) document in an intact format from the hierarchical database, the method further comprising:

receiving a key that uniquely identifies the XML document within the hierarchical database;

locating a first database node of the hierarchical database identified by the key;

sequentially writing raw data from the first database node into the XML document;

selecting a descendant database node of the first database node, in response to an indicator in the first database node, and sequentially

writing raw data from the descendant database record into the XML document.

9. (Original) The article of manufacture of claim 8, wherein the first database node and descendant database node have at most one direct descendant.

10. (Original) The article of manufacture of claim 1, wherein the metadata schema comprises a database field type identifier and an XML element data type identifier that maps to the database field type identifier, the method further comprising selectively converting content data between the XML element data type and the database field type based on the database field type identifier and the XML element data type identifier.

11. (Original) The article of manufacture of claim 1, wherein the metadata schema comprises an XML schema generated from the hierarchical database and a database schema indicative of database field names and associated database field types for database fields of the hierarchical database, the database field names each mapping to a corresponding XML element in the XML schema.

12. (Canceled).

13. (Currently Amended) An apparatus for passing data between an eXtensible Markup Language (XML) document and a hierarchical database, the apparatus comprising:

a hierarchical database managed by an Information Management System (IMS) operating on a computer having a processor and memory;

a metadata schema derived from the hierarchical database, the metadata schema comprising a first representation representative of the hierarchical structure of the hierarchical database, a second representation representative of the hierarchical structure of XML documents valid for passing into and out of the hierarchical database, a database field name, and an XML element name that maps to the database field name; and

a mapping module in external communication with the hierarchical database and configured to pass data between an XML document and the hierarchical database using the metadata schema[[.]] , the mapping module operating on a computer having a processor and memory, the mapping module comprising:

an input module configured to receive an XML document comprising XML elements organized according to a metadata schema;

a matching module configured to match an XML element of the XML document with a metadata element defined in the metadata schema; and

a storage module configured to store content data from the XML element in a database field of the hierarchical database identified by the matching metadata element; and

the mapping module further configured to store an intact XML document in the hierarchical database, the mapping module comprising:

an input module configured to receive an XML document and a database node identifier;

an initialization module configured to initialize a first database node of the hierarchical database identified by the database node identifier;

the storage module further configured to sequentially write raw data from the beginning of the XML document into the first database node; and

a breakpoint module configured to selectively identify a break point in the XML document, in response to the first database node filling with raw data, the breakpoint module:

initializing a second database node that is a child of the first database node; and

sequentially writing raw data from the break point of the XML document into the second database node.

14. (Canceled).

15. (Currently Amended) The apparatus of claim ~~14~~ 13, further comprising:

an analysis module configured to examine each XML element in the XML document and corresponding metadata element in the metadata schema, in response to an index indicator identified within the metadata schema for the XML document;

wherein the storage module is configured to store an index value from an XML element identified by the index indicator; and

a generator configured to generate a secondary index that includes the first database node and at least the index value, such that the first database node is locatable using a database query that includes the index value.

16. (Original) The apparatus of claim 13, wherein the mapping module is configured to retrieve the eXtensible Markup Language (XML) document from the hierarchical database, the apparatus further comprising:

an input module configured to receive a query for the XML document;

a matching module configured to match each database field of a sub-tree of the hierarchical database with a metadata element defined in a metadata schema;

a generator configured to generate an XML element defined by the matching metadata element, the XML element comprising content data from the matching database field; and

an assembler configured to assemble the XML elements into the XML document.

17. (Original) The apparatus of claim 13, wherein the metadata schema comprises a set of java classes representative of one or more nodes and one or more fields of the hierarchical database.

18. (Currently Amended) A system for passing data between an eXtensible Markup Language (XML) document and a hierarchical database, the apparatus comprising:

an interface operating on a computer having a processor and memory, the interface configured to receive commands for passing data between a hierarchical database and an XML document comprising an input module configured to receive an XML document comprising XML elements organized according to a metadata schema;

a database schema comprising a set of java classes representative of one or more nodes and one or more database fields of the hierarchical database, the java classes comprising a database field name and a corresponding XML element name;

an XML schema corresponding to the XML document and configured such that the XML schema comprises a representation of the hierarchical structure of the hierarchical database and an XML element name that maps to the database field name in the database schema; and

a mapping module in external communication with the hierarchical database and configured to pass data between the XML document and the hierarchical database using the database schema in conjunction with the XML schema[[.]] , the mapping module operating on a computer having a processor and memory, the mapping module comprising:

a matching module configured to match an XML element of the XML document with a metadata element defined in the metadata schema; and

a storage module configured to store content data from the XML element in a database field of the hierarchical database identified by the matching metadata element; and

the mapping module further configured to store an intact XML document in the hierarchical database, the mapping module comprising:

the input module further configured to receive an XML document and a database node identifier;

an initialization module configured to initialize a first database node of the hierarchical database identified by the database node identifier;

the storage module further configured to sequentially write raw data from the beginning of the XML document into the first database node; and

a breakpoint module configured to selectively identify a break point in the XML document, in response to the first database node filling with raw data, the breakpoint module:

initializing a second database node that is a child of the first database node; and

sequentially writing raw data from the break point of the XML document into the second database node.

19. (Canceled).

20. (Original) The system of claim 18, wherein the interface comprises an input module configured to receive a query for the XML document and portions of the XML document, and wherein the mapping module further comprises:

a matching module configured to match each database field of a sub-tree of the hierarchical database with a metadata element defined in a metadata schema;

a generator configured to generate an XML element defined by the matching metadata element, the XML element comprising content data from the matching database field; and

an assembler configured to assemble the XML elements into the XML document.